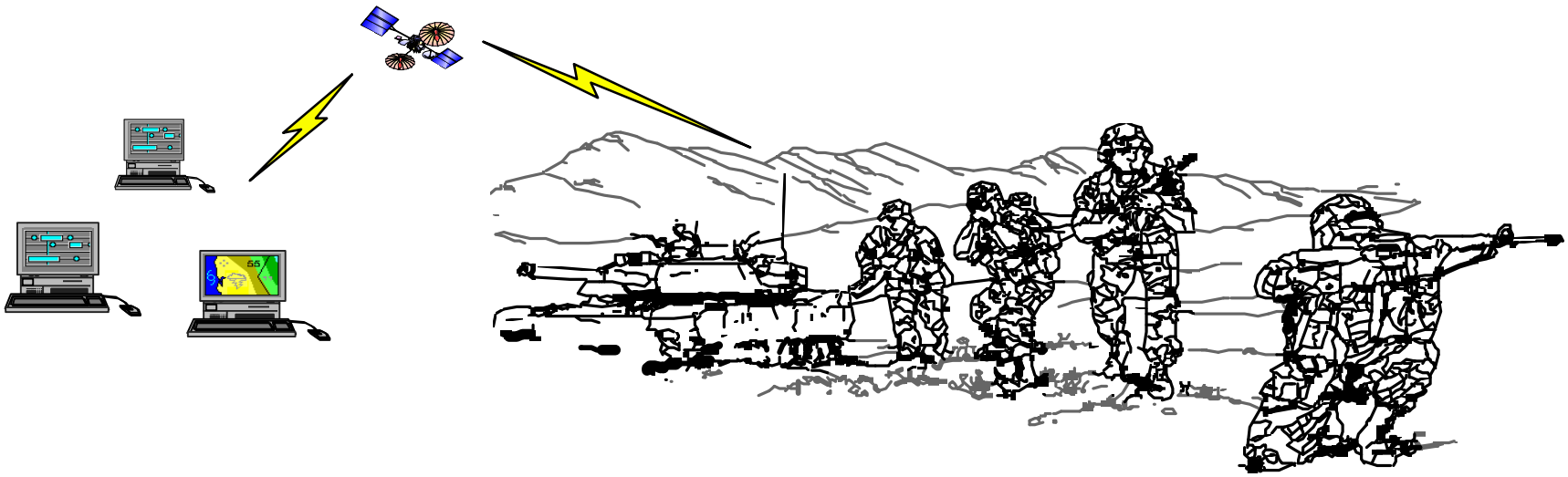
A Tour* Through the Virtual Collaboratory



* Tour through the process and concept vision

The software environment for information systems and technology evaluation

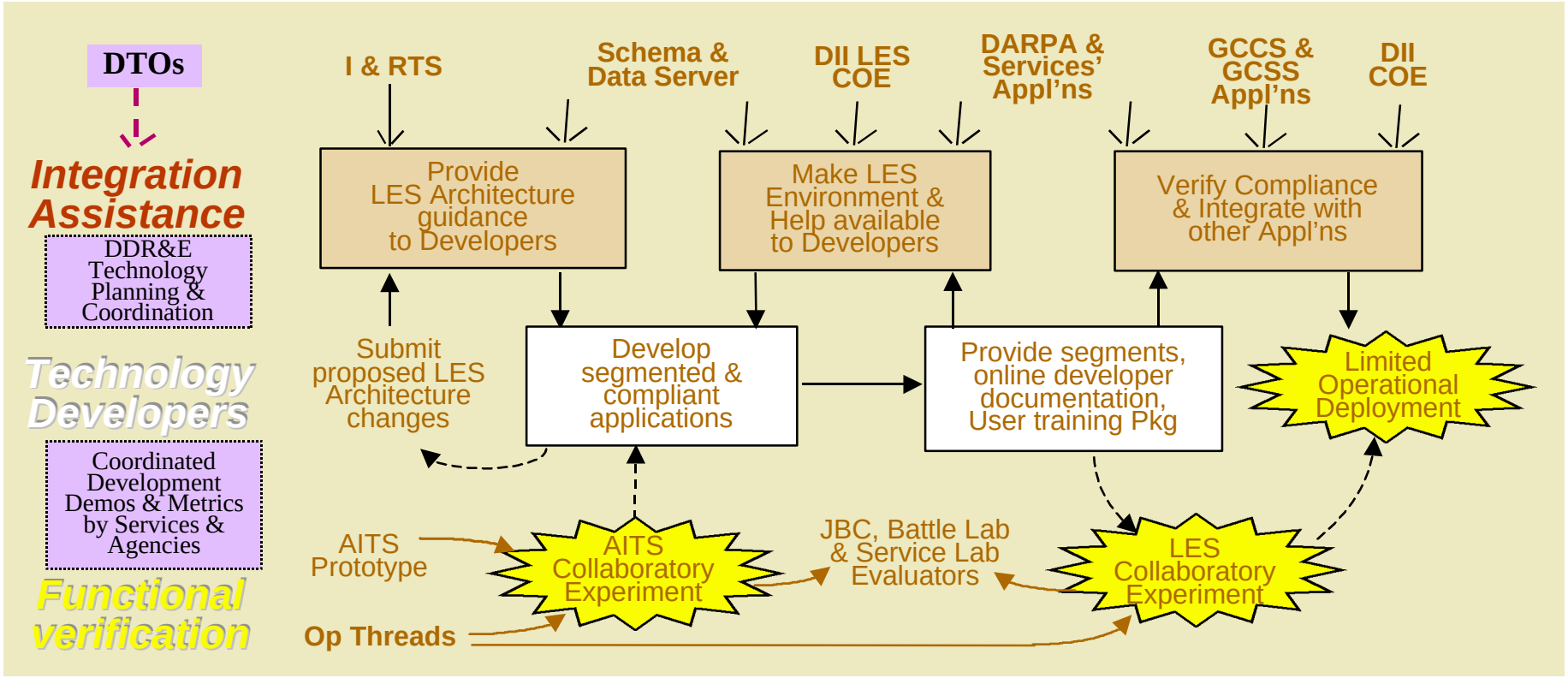
- Advanced Information Technology Services (AITS)
  - Early prototypes of C4ISR capabilities loosely integrated to accomplish an operational demonstration function
  - Integration through shared databases and demo context
- Leading Edge Services (LES)
  - Communications and network services not available on DISN and deployed tactical systems
  - Relatively stable, configuration-managed prototypes for leave-behind as segmented capabilities of the DII-based systems such as GCCS, GCSS or Service/Agency C4ISR
  - “Server” capabilities which will have limited deployment but which must interact with deployed client segments
  - Acceptable level of online support, ILS and potential sponsorship for full integration into deployed systems

Steps in Collaborative C4I Development

- **Technology Planning**
  - Rationalizing the Defense Technology Objectives roadmap and partioning the R&D efforts emphasize developing agencies' strengths
- **Operational Validation**
  - Exposing the aggregate C4I capability to early surrogate warfighter evaluation to justify continued investment
- **Technical Verification**
  - Insuring that all of the technology pieces, developed in a distributed manner, will integrate and interoperate
- **Functional Validation**
  - Limited deployment and testing in the hands of actual warfighters

Process for Development within the Technology Integration Environment & Virtual Collaboratory

Technology Planning | **Operational Validation** | **Technical Verification** | **Functional Validation**



Potential for earlier transition at a higher level of compliance and verified operational utility

Transition from AITS to LES at Level 5 Compliance

Transition to GCCS or GCSS at Level 6-8 Compliance

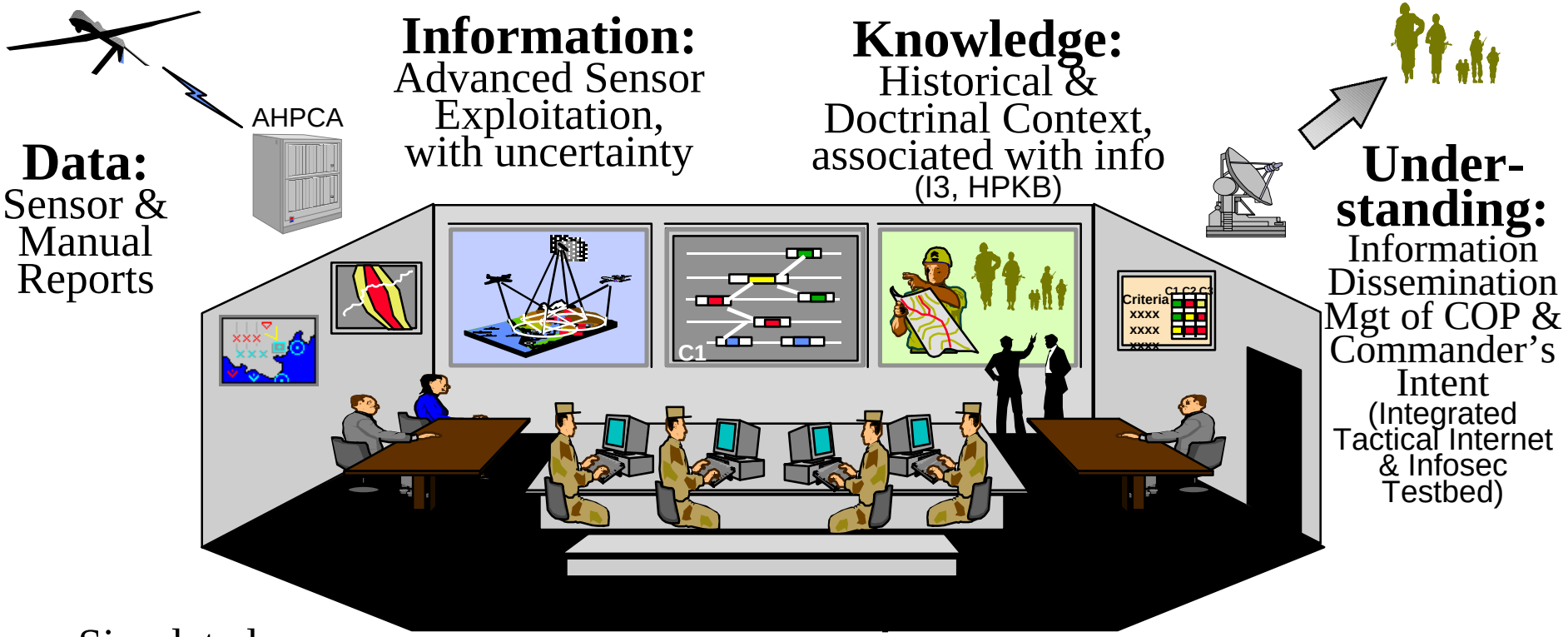
Technology Planning - the DDR&E Info Systems & Technology Panel

- DDR&E IS&T Panel defines Defense Technology Objectives (DTOs) and a roadmap for critical technology development efforts to lead to those objectives
- The Services allocate their efforts to address the technologies defined in the roadmap (6.1 thru 6.3)
- The IS&T Panel lays out a series of collaborative demonstrations and critical experiments to integrate and assess the technology milestones
- The Joint Warfighter S&T Plan lays out a plan for integrated demonstrations of ACTD technologies, and USD(AT) identifies CINCs to provide operational oversight of related ACTDs

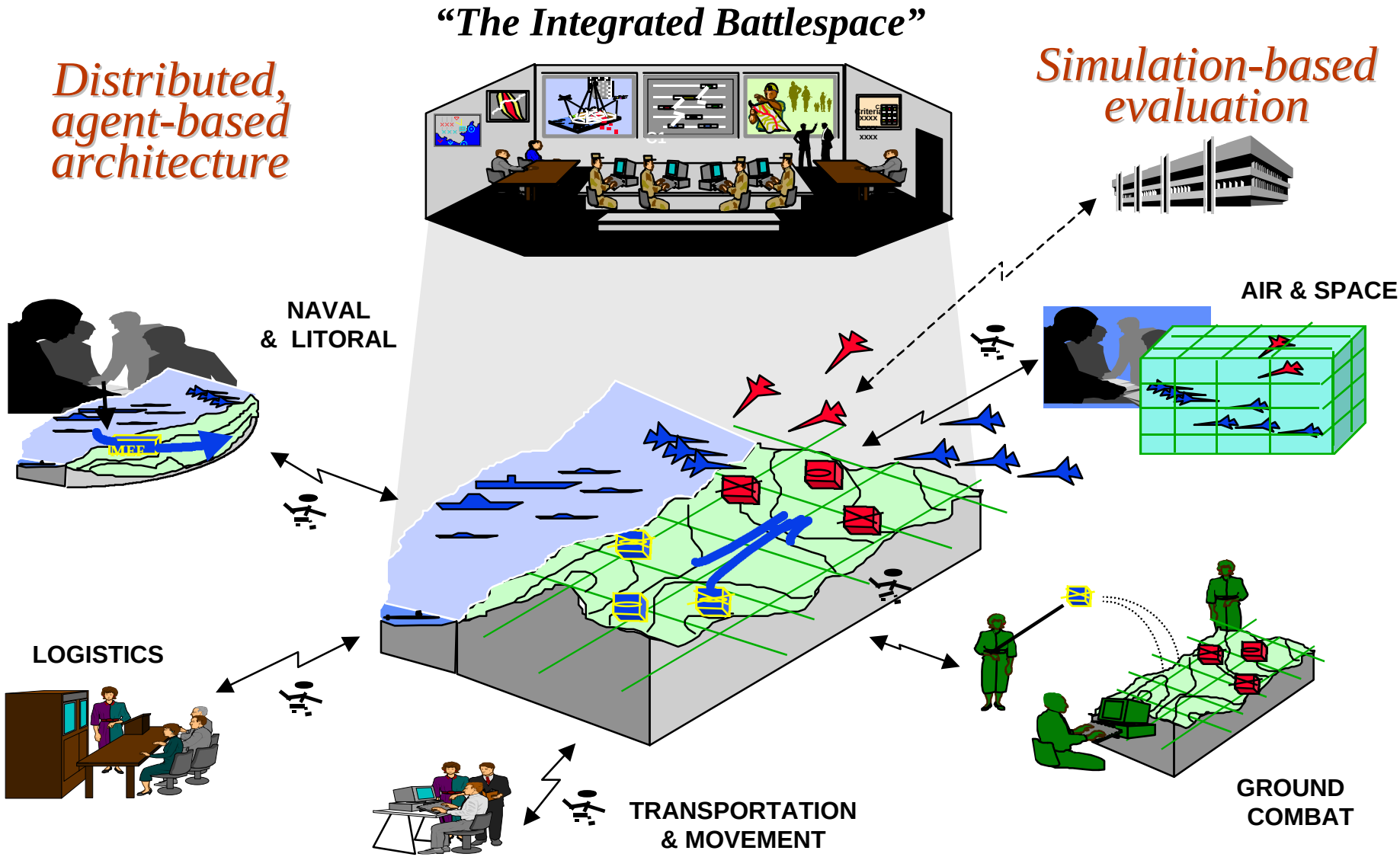
Operational Validation

- As C4I technology prototypes become available, they are exposed to joint warfighters for early evaluation of their operational potential and payoff
  - *First in a stand-alone, "demonstration" environment*
    - Minimal integration, common demonstration context
    - Visionary capabilities, not necessarily fully developed
  - *Then, in a distributed demonstration environment which permits exposure of multiple, related capabilities to multiple warfighters in a simulated warfighting context*
    - Common operational thread
    - Visual and data integration via shared demo databases
    - Simulation/wargame-driven or controlled live scenario replay
    - Data sets, scenarios, demonstration code available online via the NIPRnet/SIPRnet web
    - Code is loosely configuration managed through technical functional upgrades

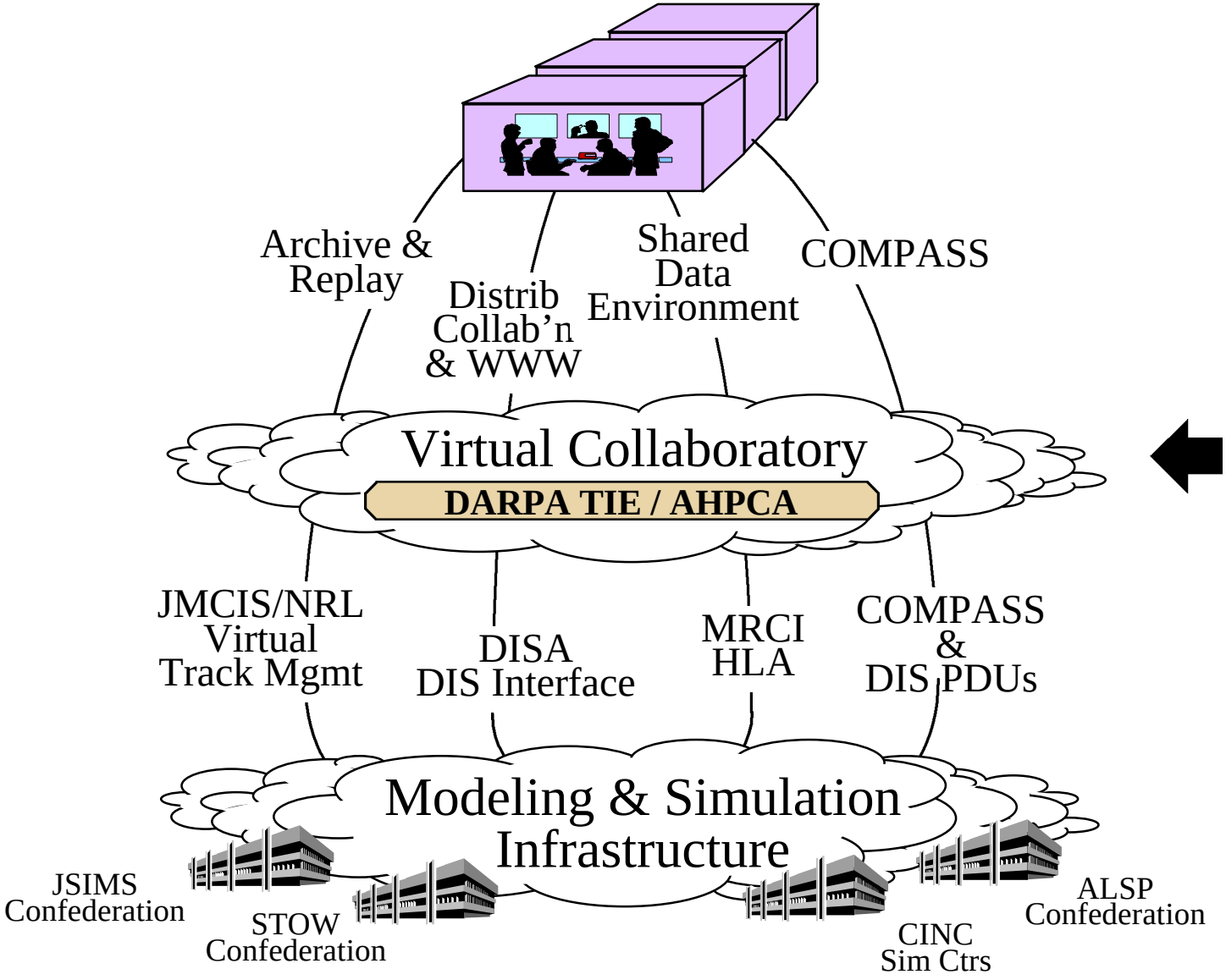
Early Evaluation in the Information Technology Integration Environment



Early Evaluation in the AITS Virtual Collaboratory



Interfaces between the Surrogate Decision Maker and the Simulation Community



C2I Systems & Centers

- Session Mgmt
- Overlay Mgmt
- Analysis Mgmt
- Mission Replay

Real-World & Replay Data

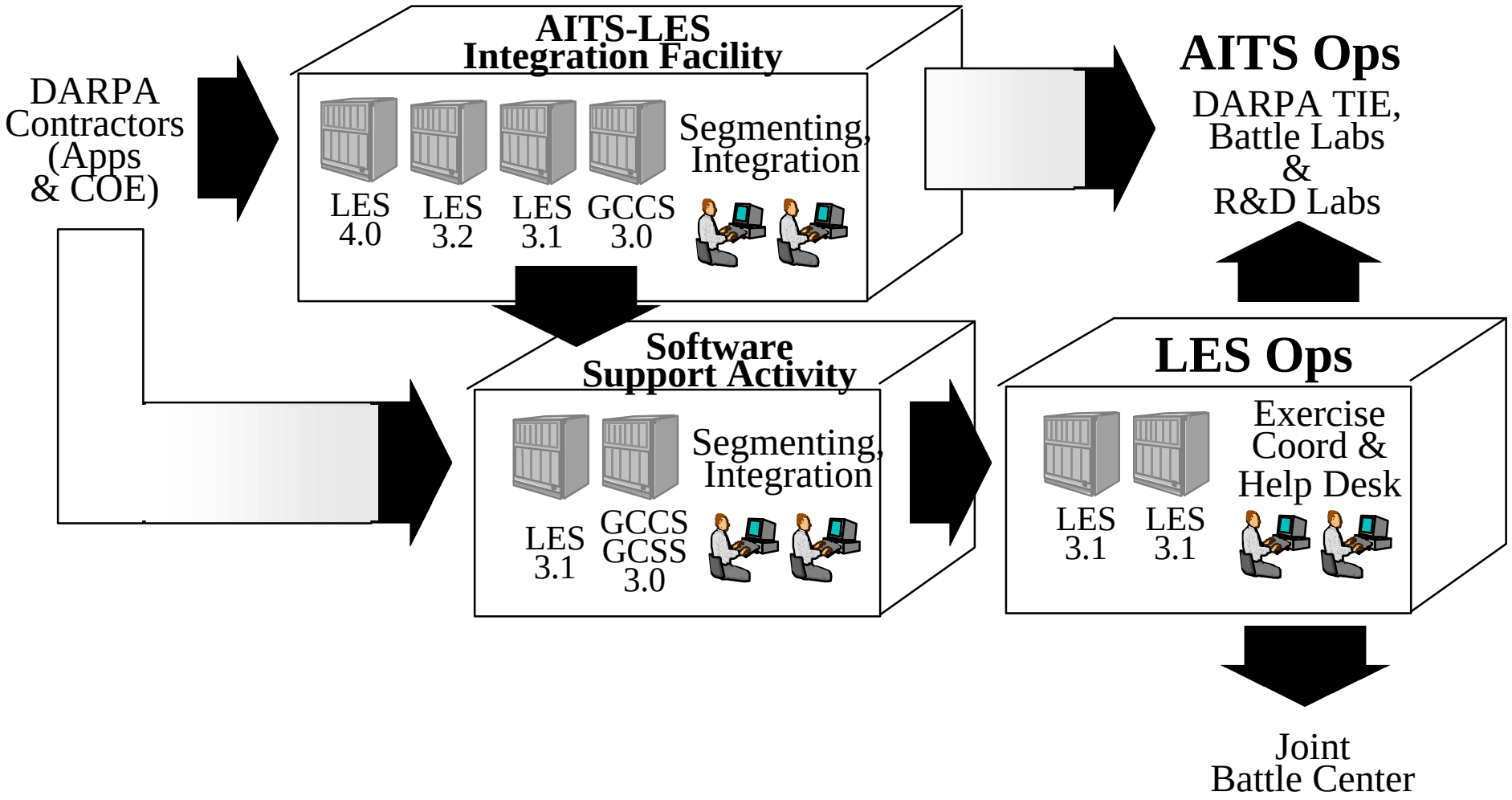
- Session Mgmt
- Overlay Mgmt
- Analysis Mgmt
- Mission Replay

JTASC & Battle Labs Real-World & Sim Data

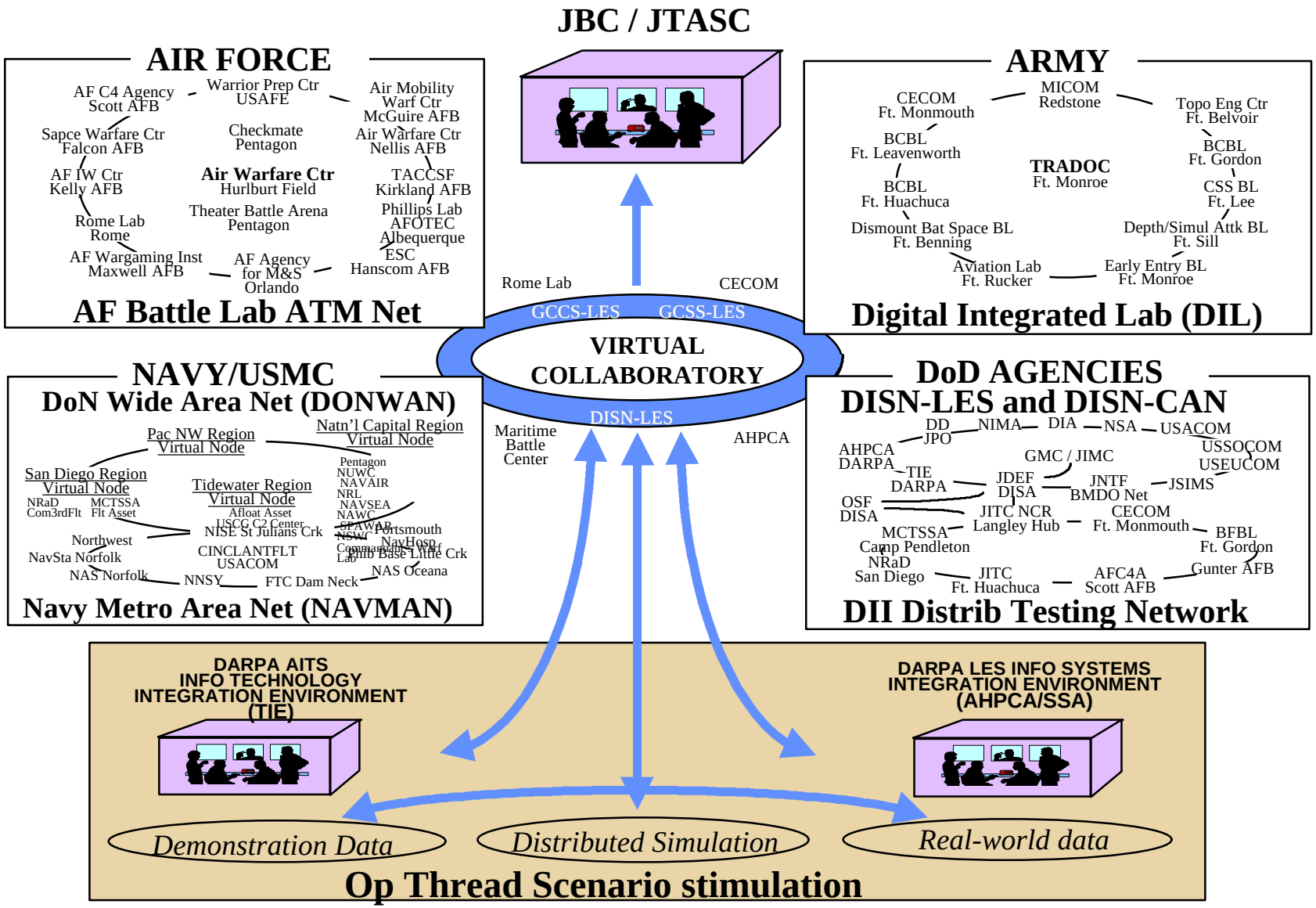
Technical Verification

- Developers segment capabilities into components which are compatible with the version of the DII or DII LES that is target for the timeframe of their production release
  - DII COE, GCCS, GCSS for completing ACTDs
  - DII LES, GCCS-LES or GCSS-LES for early ACTDs and ATDs with leave-behind
- Segments are integrated into appropriate version of production or LES systems
  - Mission applications, common support applications, COE kernal/COE candidates, shared data environment
- Integration is verified in controlled testing prior to release
- Segmented code, data, and documentation is available to other developers on the web; and segmentation is configuration managed through subsequent technical and functional upgrades
- Provide configuration management, hardening and development support from LES integration facility
- Successful technical demonstrations can lead to limited deployment decisions and final verification at OSF/DCTF

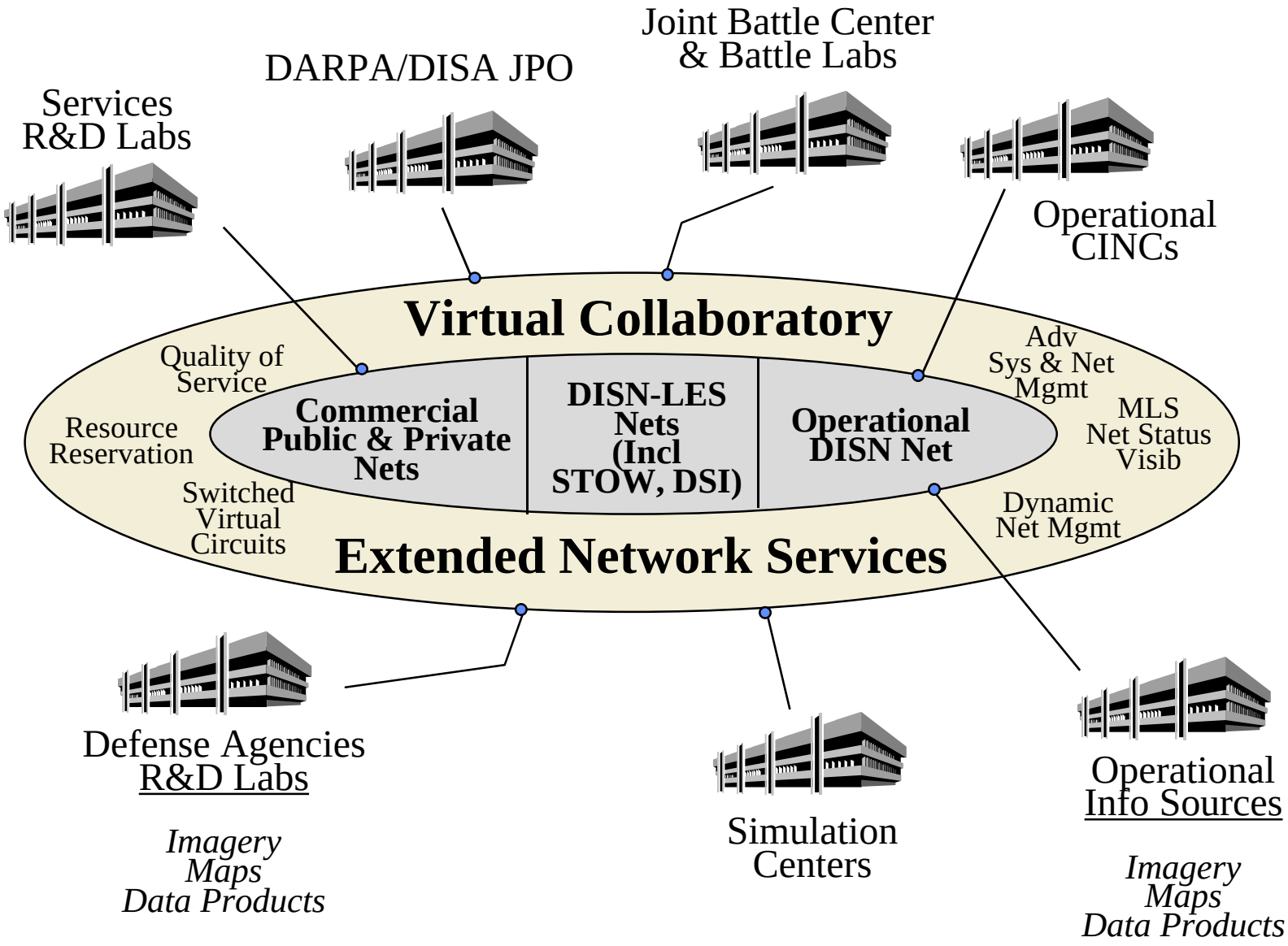
Information Systems Integration Environment - the LES



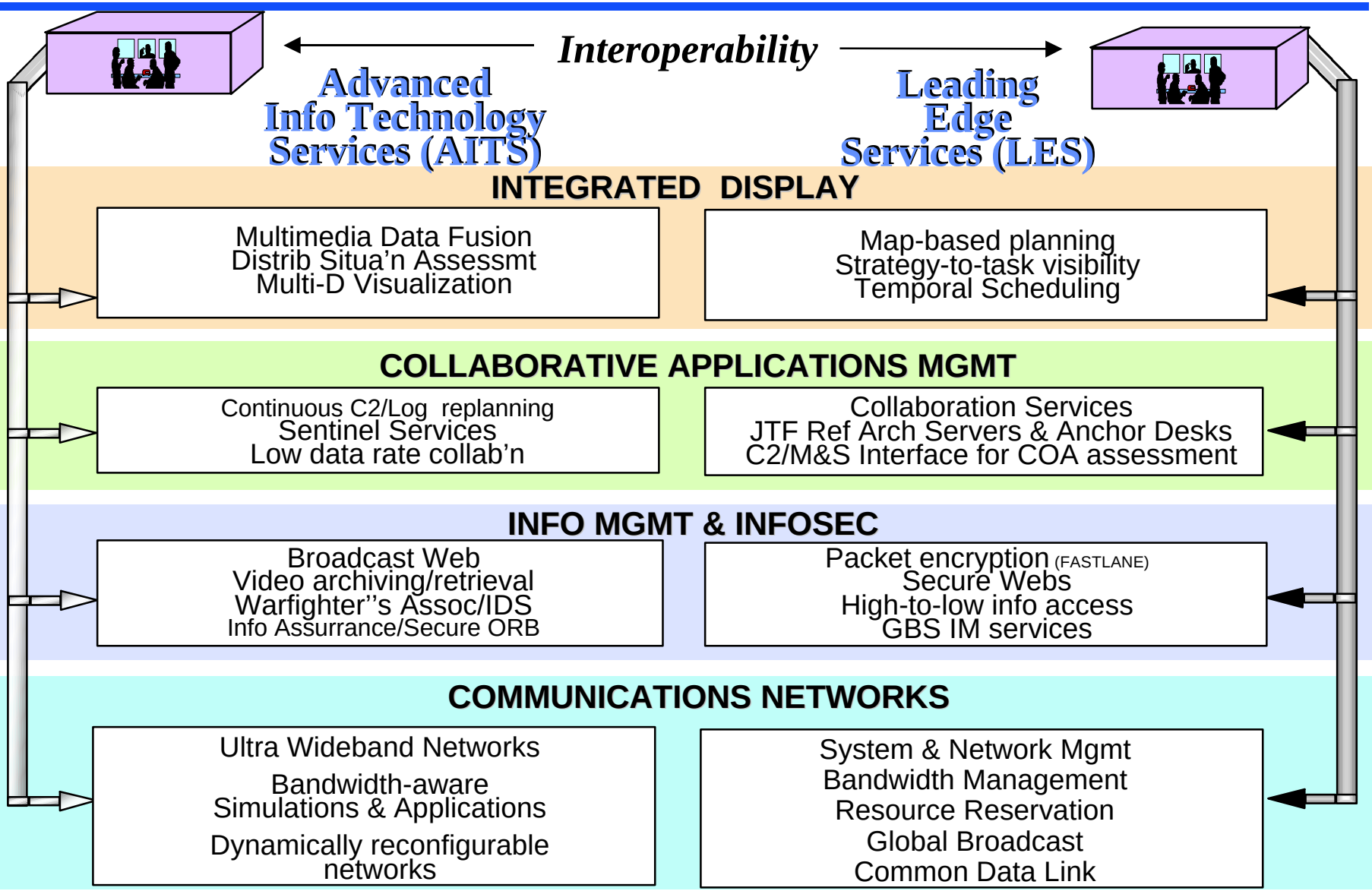
DII AITS-LES Environment
The Battle Laboratories as Surrogate Warfighters



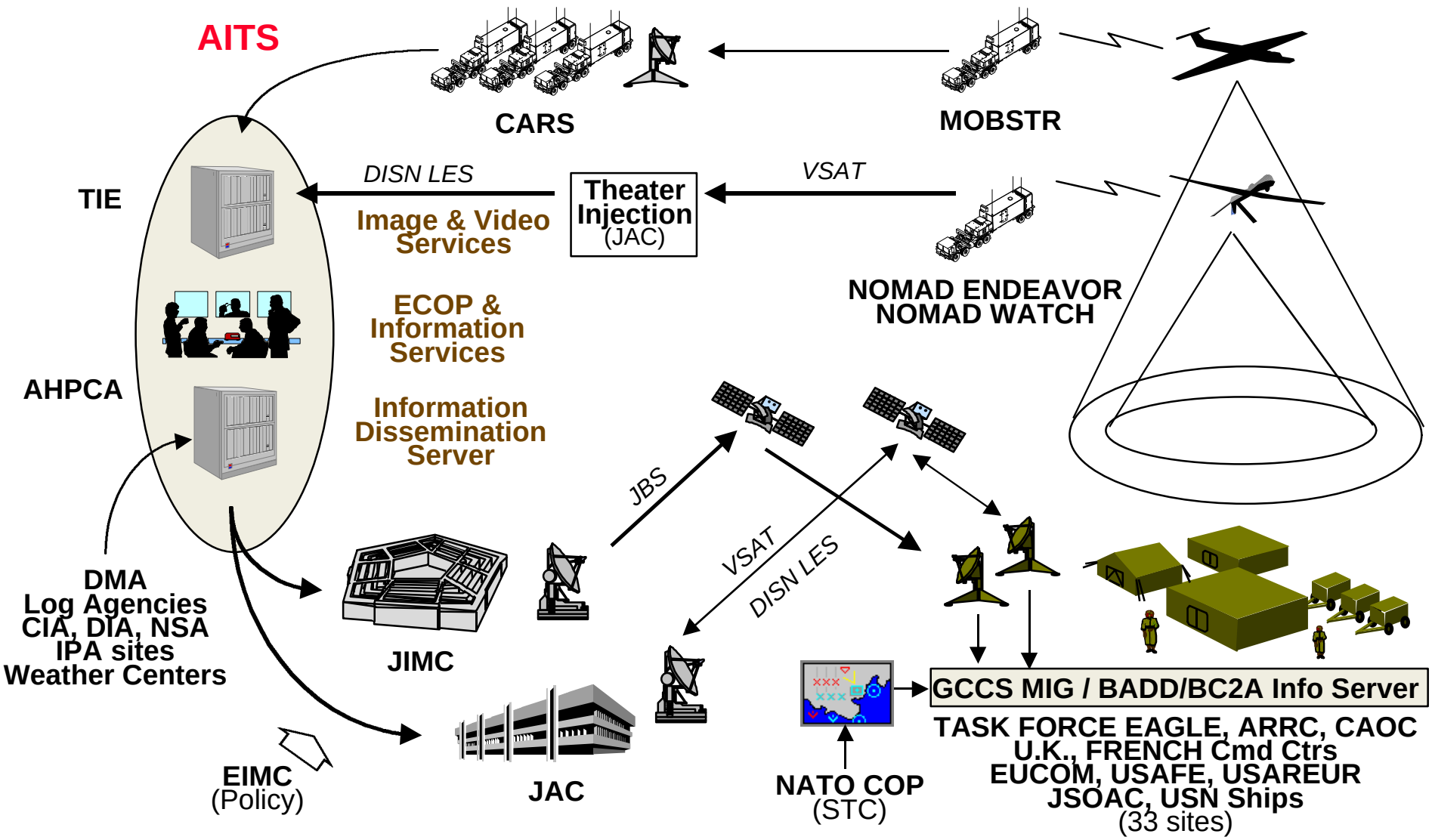
Connectivity to the AITS-LES Integration Environment



Collaboratory Experiments/Demonstrations on Several Levels



GCCS-LES Deployment to Bosnia



Functional Validation

- Upon LES technical validation and decision to deploy, perform final integration validation at the GCCS or GCSS certification facilities (OSF, DCTF)
- Provide online monitoring and help desk functions from LES ops center to selected CINCs during ACTD deployment
- Provide cross-ACTD integration and ACTD/DII integration support during later phases of ACTDs and ATDs with leave-behind...in order to achieve interoperability and database compatibility